IN THE CLAIMS:

Please amend claim 48 as set forth below.

1. (previously presented) A content addressable memory (CAM) device comprising:
a first plurality of storage circuits to store an upper value;
a second plurality of storage circuits to store a lower value;
a plurality of compare circuits to determine if a first comparand value is within a range of values defined by the upper value and the lower value, wherein the upper value comprises a plurality of bits ordered from a most significant bit to a least significant bit, and wherein each of the plurality of compare circuits is adapted to receive a respective one of the plurality of bits and to compare the one of the plurality of bits to a respective bit within the first comparand value; and
a match line, wherein a most significant compare circuit of the plurality of compare circuits is coupled to the match line, the most significant compare circuit including circuitry to affect a logical state of the match line if either (1) a most significant bit of the first comparand value is greater than the most significant bit of the upper value, or (2) the most significant bit of the first comparand is equal to the most significant bit of the upper value, and a result signal from a less significant compare circuit of the plurality of compare circuits indicates that the first comparand value minus the value represented by the most significant bit of the first comparand value is greater than the upper value minus the value represented by the most significant bit of the upper value.

2. (original) The CAM device of claim 1 wherein the first comparand value is a field of bits within a second comparand value.

3. (original) The CAM device of claim 1 wherein each of the first plurality of storage circuits includes a memory element to store at least one bit of the upper value.

4. (original) The CAM device of claim 1 wherein each of the plurality of compare circuits includes circuitry to compare a bit of the first comparand to a bit of the upper value and to output a result signal in a first state if the bit of the first comparand is greater than the bit of the upper value and to output the result signal in a second state if the bit of the first

comparand is less than the bit of the upper value.

5. (original) The CAM device of claim 4 wherein outputting the result signal in a first state comprises switchably coupling a match signal line to a predetermined voltage reference to affect a voltage level of the match signal line.

6. (original) The CAM device of claim 5 wherein outputting the result signal in the second state comprises decoupling the match signal line from the predetermined voltage reference.

7. (original) The CAM device of claim 5 wherein coupling the match signal line to a predetermined voltage reference comprises coupling the match signal line to a ground voltage reference to pull down the voltage level of the match signal line.

8. (original) The CAM device of claim 4 further comprising a match line, and wherein a most significant compare circuit of the plurality of compare circuits is coupled to the match line, the most significant compare circuit being adapted to affect a logical state of the match line according to the result signal.

9. (original) The CAM device of claim 8 wherein the most significant compare circuit is coupled to output the result signal to the match line.

10. (original) The CAM device of claim 8 wherein at least one other of the plurality of compare circuits is coupled to output the result signal to the most significant compare circuit.

11. (canceled)

12. (canceled)

13. (previously presented) The CAM device of claim 1 wherein the lower value comprises a plurality of bits ordered from a most significant bit to a least significant bit, and wherein each of the plurality of compare circuits is adapted to receive a respective one of the plurality of bits and to compare the one of the plurality of bits to a respective bit within the

first comparand value.

14. (previously presented) A content addressable memory (CAM) comprising:
a first plurality of storage circuits to store an upper value;
a second plurality of storage circuits to store a lower value; and
a plurality of compare circuits to determine if a first comparand value is within a range of values defined by the upper value and the lower value, wherein the lower value comprises a plurality of bits ordered from a most significant bit to a least significant bit, and wherein each of the plurality of compare circuits is adapted to receive a respective one of the plurality of bits and to compare the one of the plurality of bits to a respective bit within the first comparand value; and
a match line and wherein a most significant compare circuit of the plurality of compare circuits is coupled to the match line, the most significant compare circuit including circuitry to affect a logical state of the match line if either (1) a most significant bit of the first comparand value is less than the most significant bit of the lower value, or (2) the most significant bit of the first comparand is equal to the most significant bit of the lower value, and a result signal from a less significant compare circuit of the plurality of compare circuits indicates that the first comparand value minus the value represented by the most significant bit of the first comparand value is less than the lower value minus the value represented by the most significant bit of the lower value.

15. (previously presented) A content addressable memory (CAM) cell comprising:
a first storage circuit to store a first boundary value;
a first compare circuit to compare a comparand value to the first boundary value, the first compare circuit including circuitry to output a first result signal in a first state if the comparand value is greater than the first boundary value and in a second state if the comparand value is less than the first boundary value; and
an input to receive a second result signal from another CAM cell, and wherein the circuitry to output the first result signal in the first state is adapted to output the first result

signal in the first state if the comparand value is equal to the first boundary value and the second result signal is in the first state.

16. (canceled)

17. (previously presented) The CAM cell of claim 15 wherein the circuitry to output the first result signal is further adapted to output the first result signal in the second state if the comparand value is equal to the first boundary value and the second result signal is in the second state.

18. (original) The CAM cell of claim 15 further comprising:
a second storage circuit to store a second boundary value; and
a second compare circuit to compare the comparand value to the second boundary value, the second compare circuit including circuitry to output a second result signal in the first state if the comparand is less than the second boundary value and in the second state if the comparand is greater than the second boundary value.

19. (original) The CAM cell of claim 18 further comprising an input to receive a third result signal from a less significant CAM cell, and wherein the circuitry to output the second result signal in the first state is further adapted to output the second result signal in the first state if the comparand value is equal to the second boundary value and the third result signal is in the first state.

20. (original) The CAM cell of claim 15 wherein the circuitry to output the first result signal is adapted to output the first result signal in the first state if the comparand is equal to the first boundary value.

21. (original) The CAM cell of claim 15 wherein the circuitry to output the first result signal is adapted to output the first result signal in the second state if the comparand is equal to the first boundary value.

22. (original) The CAM cell of claim 15 wherein the first boundary value is an upper

boundary value.

23. (previously presented) A content addressable memory (CAM) device comprising:
a first storage circuit to store a first value; and
a compare circuit coupled to the first storage circuit to receive the first value and coupled to a mode signal line to receive a mode signal, the compare circuit being adapted to compare a comparand value to the first value and to output a first result signal, the first result signal indicating whether the comparand value is greater than the first value when the mode signal is in a first state, and the first result signal indicating whether or not the comparand is equal to the first value when the mode signal is in a second state.

24. (original) The CAM device of claim 23 further comprising a second storage circuit to store a second value and coupled to provide the second value to the compare circuit, the compare circuit including circuitry to compare the comparand value to the second value and to output a second result signal, the second result signal indicating whether the comparand is less than the second value when the mode signal is in the first state.

25. (original) The CAM device of claim 23 further comprising:
a second storage circuit to store a second value and coupled to provide the second value to the compare circuit, the compare circuit including circuitry to compare the comparand value to the second value and, when the mode signal is in the first state, to output a second result signal indicating whether the comparand is less than the second value; and
a mask circuit coupled to receive the second value from the storage circuit and coupled to the compare circuit, the mask circuit being adapted to selectively mask the first result signal, according to the second value, when the mode signal is in the second state.

26. (original) The CAM device of claim 25 wherein the mask circuit is adapted to mask the first result signal by preventing the compare circuit from outputting the first result signal in a state indicative of inequality between the first value and the comparand.

27. (original) The CAM device of claim 25 wherein the mask circuit is adapted to mask the first result signal by disabling the first value from being received in the compare circuit.

28. (original) The CAM device of claim 25 wherein the mask circuit is adapted to mask the first result signal by disabling the comparand value from being received in the compare circuit.

29. (original) A content addressable memory (CAM) device comprising:
a first storage circuit to store a first value; and
a first compare circuit coupled to receive the first value from the first storage circuit and having a select input to receive a level select signal, the first compare circuit being adapted to compare a comparand value to the first value and to assert a beyond-boundary signal if the level select signal is in a first state and if the comparand value is greater than the first value, the first compare circuit being further adapted to assert the beyond-boundary signal if the level select signal is in a second state and if the comparand value is less than the first value.

30. (previously presented) The CAM device of claim 29 further comprising:
a first input to receive a first signal representative of the comparand value;
a second input to receive a second signal representative of a complement of the comparand value; and
a select circuit coupled to the first input and the second input to select, according to a state of the level select signal, either the first signal or the second signal to be output to the compare circuit for comparison with the first value.

31. (original) The CAM device of claim 30 wherein the select circuit is a multiplexer having a control input coupled to receive the level select signal and having first and second ports coupled respectively to the first and second inputs.

32. (original) The CAM device of claim 29 wherein the first value is representative of an upper boundary value when the level select signal is in the first state, and wherein the first

value is representative of a lower boundary value when the level select signal is in the second state

33. (original) The CAM device of claim 29 further comprising a mode select input to receive a mode select signal, the first compare circuit being enabled to assert the beyond-boundary signal if the mode select signal is in a first state and the first compare circuit being disabled from asserting the beyond-boundary signal if the mode select signal is in a second state.

34. (original) The CAM device of claim 33 further comprising a second compare circuit to compare the comparand value and the first value and to assert a match signal indicative of whether the comparand value is equal to the first value, the second compare circuit being enabled to assert the match signal if the mode select signal is in the second state, and the second compare circuit being disabled from asserting the match signal if the mode select signal is in the first state.

35. (previously presented) A content addressable memory (CAM) device comprising:
a CAM array having a plurality of CAM cells; and
at least one mode select line coupled to at least one set of CAM cells within the plurality of CAM cells, the set of CAM cells being adapted to compare a comparand value to a range defined, at least in part, by a first value stored within the set of CAM cells if a mode select signal on the mode select line is in a first state, and the set of CAM cells being adapted to determine whether or not the comparand value is equal to the first value if the mode select signal is in a second state.

36. (original) The CAM device of claim 35 further comprising a mode configuration circuit coupled to the mode select line, the mode configuration circuit including a storage circuit to store a mode value, the mode select signal being in either the first state or the second state according to the mode value.

37. (original) The CAM device of claim 36 further comprising an interface to receive a first instruction from a host processor, the CAM device being adapted to store the mode value in the storage circuit in response to the first instruction.

38. (original) The CAM device of claim 36 further comprising a mode select interface, and wherein the mode select line is coupled to the mode select interface to receive the mode select signal from an external device.

39. (original) The CAM device of claim 38 wherein the external device is a host processor.

40. (previously presented) A system comprising:
a processor; and
a content addressable memory (CAM) device coupled to receive instructions and data values from the processor, the CAM device including a plurality of CAM cells and being responsive to a first instruction from the processor to select either a first operating mode or a second operating mode for the plurality of CAM cells, the plurality of CAM cells being adapted to compare a comparand value to a range defined, at least in part, by a first value stored within the plurality of CAM cells if the first operating mode is selected, and the plurality of CAM cells being adapted to determine whether or not the comparand value is equal to the first value if the second operating mode is selected.

41. (original) The system of claim 40 wherein the CAM device includes a mode configuration circuit to store a mode select value in response to the first instruction, the mode select value indicating the first operating mode or the second operating mode according to the first instruction.

42. (original) The system of claim 41 wherein the plurality of CAM cells is responsive to the mode select value to operate in either the first operating mode or the second operating mode.

43. (previously presented) The system of claim 41 wherein the CAM device includes additional CAM cells configured to operate only in the first operating mode.

44. (original) The system of claim 41 wherein the CAM device includes additional CAM cells

configured to operate only in the second operating mode.

45. (previously presented) A system comprising:
a processor; and
a content addressable memory (CAM) device coupled to receive instructions from the processor, the CAM device including a first plurality of CAM cells and being responsive to a first instruction from the processor to store a first boundary value in the first plurality of CAM cells, the first plurality of CAM cells being adapted to compare the first boundary value with a first comparand value in a compare operation and to output a first result signal indicative of whether the first comparand value is greater than the first boundary value, wherein the first plurality of CAM cells are responsive to a mode select signal to operate in either a range mode or a ternary mode, the first plurality of CAM cells being adapted to output the first result signal when operated in the range mode.

46. (canceled)

47. (previously presented) A system comprising:
a processor; and
a content addressable memory (CAM) device coupled to receive instructions from the processor, the CAM device including a first plurality of CAM cells and being responsive to a first instruction from the processor to store a first boundary value in the first plurality of CAM cells, the first plurality of CAM cells being adapted to compare the first boundary value with a first comparand value in a compare operation and to output a first result signal indicative of whether the first comparand value is greater than the first boundary value, wherein the first plurality of CAM cells are responsive to a mode select signal to operate in either a range mode or a binary mode, the first plurality of CAM cells being adapted to output the first result signal when operated in the range mode.

48. (currently amended) A system comprising:

a processor; and

a content addressable memory (CAM) device coupled to receive instructions from the processor, the CAM device including:

a first plurality of CAM cells ~~and being responsive to a first instruction from the processor~~ to store a first boundary value in the first plurality of CAM cells in response to a first instruction from the processor, the first plurality of CAM cells being adapted to compare the first boundary value with a first comparand value in a compare operation and to output a first result signal indicative of whether the first comparand value is greater than the first boundary value; and

a second plurality of CAM cells to store a data value, the second plurality of CAM cells being adapted to compare the data value with a second comparand value in a compare operation and to output a first result signal indicative of whether the second comparand value is equal to the data value.

49. (original) The system of claim 48 wherein the first plurality of CAM cells and the second plurality of CAM cells are each included within a first row of CAM cells within the CAM device.

50. (original) The system of claim 48 wherein the first comparand value and the second comparand value each constitute a respective field of bits within a third comparand value.

51. (original) The system of claim 45 wherein the CAM device is further responsive to the first instruction from the processor to store a second boundary value in the first plurality of CAM cells, and the first plurality of CAM cells being further adapted to compare the second boundary value with the second comparand in the compare operation and to output a second result signal indicative of whether the first comparand value is less than the second boundary value.

52. (previously presented) A system comprising:

a processor; and

a content addressable memory (CAM) device coupled to receive instructions from the

processor, the CAM device including a first plurality of CAM cells and being responsive to a first instruction from the processor to store a first boundary value in the first plurality of CAM cells, the first plurality of CAM cells being adapted to compare the first boundary value with a first comparand value in a compare operation and to output a first result signal indicative of whether the first comparand value is greater than the first boundary value, wherein the CAM device includes multiple independently searchable storage blocks each having multiple rows of CAM cells therein, the first plurality of CAM cells being included within one of the rows of CAM cells in one of the searchable storage blocks.

53. (original) The system of claim 52 wherein the CAM device further includes a block configuration circuit to store a block configuration value, and circuitry to configure at least one of the storage blocks to have a storage width and depth according to the block configuration value.

54. (original) The system of claim 53 wherein the CAM device is responsive to a second instruction from the processor to store the block configuration value in the block configuration circuit.

55. (original) The system of claim 53 wherein the block configuration circuit is adapted to store a mode value, and wherein the first plurality of CAM cells are responsive to the mode value to operate in either a range mode or a ternary mode, the first plurality of CAM cells being adapted to output the first result signal when operated in the range mode.

56. (original) The system of claim 55 wherein the CAM device is responsive to a second instruction from the processor to store the mode value in the block configuration circuit.

57. (original) The system of claim 53 wherein the block configuration circuit is adapted to store a mode value, and wherein the first plurality of CAM cells are responsive to the mode value to operate in either a range mode or a binary mode, the first plurality of CAM cells being adapted to output the first result signal when operated in the range mode.

58. (previously presented) A method of operation within a content addressable memory (CAM) device, the method comprising:
comparing a comparand value with a first value stored in a plurality of CAM cells within the CAM device;
asserting a first result signal if (1) the comparand value is within a range defined, at least in part, by the first value, and (2) a mode signal is in a first state; and
asserting the first result signal if (1) the comparand value matches the first value, and (2) the mode signal is in a second state.

59. (previously presented) The method of claim 58 further comprising storing the first value in the plurality of CAM cells in response to a write instruction.

60. (previously presented) The method of claim 58 wherein, when the mode signal is in the first state, comparing the comparand value with the first value comprises, in each CAM cell of the plurality of CAM cells, asserting a greater-than signal if either (1) a bit of the comparand value received within the CAM cell is greater than a bit of the first boundary value stored within the CAM cell, or (2) the bit of the comparand value is equal to the bit of the first boundary value and a greater-than signal is received from a less significant CAM cell within the plurality of CAM cells.

61. (previously presented) The method of claim 58 wherein, when the mode signal is in the first state, a greater-than signal asserted by a most significant one of the plurality of CAM cells constitutes the first result signal.

62. (previously presented) The method of claim 58 further comprising:
comparing a comparand value with a second value stored in the plurality of CAM cells; and
asserting a second result signal if the comparand value is less than the second value.

63. (previously presented) The method of claim 62 wherein comparing the comparand value with the second value comprises, in each CAM cell of the plurality of CAM cells, asserting

a less-than signal if either (1) a bit of the comparand value received within the CAM cell is less than a bit of the second value stored within the CAM cell, or (2) the bit of the comparand value is equal to the bit of the second value and a less-than signal is received from a less significant CAM cell within the plurality of CAM cells.

64. (original) The method of claim 63 wherein a less-than signal asserted by a most significant one of the plurality of CAM cells constitutes the second result signal.

65. (previously presented) A content addressable memory (CAM) device comprising:
means for comparing a comparand value with a first value stored in a plurality of CAM cells within the CAM device; and
means for asserting a first result signal if (1) the comparand value is within a range defined, at least in part, by the first value and (2) a mode signal is in a first state; and
means for asserting the first result signal if (1) the comparand matches the first value, and (2) the mode signal is in a second state.

66. (previously presented) The CAM device of claim 65 further comprising means for storing the first value in the plurality of CAM cells in response to a write instruction.

67. (previously presented) The CAM device of claim 65 wherein the means for comparing a comparand value with a first value comprises respective means within each CAM cell of the plurality of CAM cells for asserting a greater-than signal if either (1) a bit of the comparand value received within the CAM cell is greater than a bit of the first value stored within the CAM cell, or (2) the bit of the comparand value is equal to the bit of the first value and a greater-than signal is received from a less significant CAM cell within the plurality of CAM cells.

68. (previously presented) The CAM device of claim 65 further comprising:
means for comparing a comparand value with a second value stored in the plurality of CAM cells; and
means for asserting a second result signal if the comparand value is less than the second value.

69. (previously presented) The CAM device of claim 68 wherein the means for comparing a comparand value with a second value comprises respective means within each CAM cell of the plurality of CAM cells for asserting a less-than signal if either (1) a bit of the comparand value received within the CAM cell is less than a bit of the second value stored within the CAM cell, or (2) the bit of the comparand value is equal to the bit of the second value and a less-than signal is received from a less significant CAM cell within the plurality of CAM cells.

70. (previously presented) A CAM device comprising:

at least one range compare cell configured to store a bit of a range limit, wherein the at least one range compare cell is further configured to output a first result signal that indicates whether a first bit of a comparand is outside of a range defined by the bit of the range limit; and

at least one CAM cell configured to store a data bit, wherein the at least one CAM cell is further configured to output a match signal that indicates whether the stored data bit matches a second bit of the comparand, wherein at least one range compare cell and at least one CAM cell are coupled to a common match line.

71. (previously presented) The CAM device of claim 70 wherein the at least one CAM cell comprises a ternary CAM cell.

72. (previously presented) The CAM device of claim 70 wherein the at least one CAM cell comprises a binary CAM cell.

73. (previously presented) The CAM device of claim 70 wherein the at least one range compare cell comprises a configurable cell that selectively operates in one of a range compare cell mode and a ternary CAM cell mode.

74. (previously presented) The CAM device of claim 70 wherein the at least one range compare cell comprises a configurable cell that selectively operates in one of a range compare cell mode and a binary CAM cell mode.

75. (previously presented) The CAM device of claim 70 wherein the at least one range compare cell comprises:

at least one less significant range compare cell configured to output the result signal to a next more significant range compare cell, wherein the result signal is dependent on a result of a comparison of the stored range limit bit and the corresponding comparand bit, and a result signal output from a next less significant range compare cell; and

a most significant range compare cell configured to output a final result signal to the common match line, wherein the final result signal indicates at least whether the comparand is greater than or less than the stored range limit.

76. (previously presented) The CAM device of claim 70 wherein the result signal further indicates whether the stored range limit bit is equal to a corresponding comparand bit .

77. (previously presented) The CAM device of claim 75 wherein the final result signal output to the common match line further indicates whether the stored range limit is equal to the comparand.

78. (previously presented) A method for performing a range comparison operation in a content addressable memory (CAM) device to determine whether a comparand is within a range, the method comprising:

storing a first value in a plurality of range compare cells, including a most significant range compare cell, and a plurality of less significant range compare cells for storing bits of the first value according to their significance;

comparing bits of the comparand with corresponding bits of the first value;

outputting a result signal for each range compare cell based on the bit comparison, and on a result signal output by a next less significant range compare cell; and

outputting a final result signal from the most significant range compare cell to a match line, wherein the final result signal indicates at least whether the comparand is greater than or less than the first value, wherein the plurality of range compare cells comprises a plurality of configurable cells, including a most significant configurable cell, and a

plurality of less significant configurable cells for storing bits of the first value according to their significance, the method further comprising, setting a mode select signal to select a range compare mode or a ternary CAM mode, wherein, in the ternary CAM mode, the first value comprises a data word and a mask word, and wherein, in the range compare mode, the first value comprises at least one of an upper range limit and a lower range limit.

79. (previously presented) The method of claim 78 wherein the final result signal indicates the comparand is within the range when, in the range compare mode, the comparand is less than the upper range limit.

80. (previously presented) The method of claim 78 wherein the final result signal indicates the comparand is within the range when, in the range compare mode, the comparand is greater than the lower range limit.

81. (previously presented) The method of claim 78 wherein final result signal indicates the comparand is within the range when, in the range compare mode, the comparand is less than the upper range limit or equal to the upper range limit.

82. (previously presented) The method of claim 78 wherein the final result signal indicates the comparand is within the range when, in the range compare mode, the comparand is greater than or equal to the lower range limit.

83. (previously presented) The method of claim 78 wherein the final result signal indicates the comparand is within the range when, in the range compare mode, the comparand is greater than the lower range limit and less than the upper range limit.

84. (previously presented) The method of claim 78 wherein the final result signal indicates the comparand is within the range when, in the range compare mode, the comparand is greater than or equal to the lower range limit and less than or equal to the upper range limit.

85. (canceled)

86. (previously presented) The method of claim 78, further comprising:

in the ternary CAM mode,

comparing a comparand bit with a masked data bit in each of the plurality of configurable cells; and

outputting a result signal based on the comparison from each configurable cell to the common match line; and

in the range compare mode,

comparing a comparand bit with an upper range bit in each of the plurality of configurable cells;

comparing a comparand bit with a lower range bit in each of the plurality of configurable cells;

outputting a first result signal from each less significant configurable cell to a next more significant configurable cell based on the lower range comparison and on a first result signal from a next less significant configurable cell;

outputting a second result signal from each less significant configurable cell to a next more significant configurable cell based on the upper range comparison and on a second result signal from the next less significant configurable cell;

outputting a first final result signal from the most significant configurable cell to the common match line based on based on the lower range comparison and on a first result signal from a next less significant configurable cell; and

outputting a second final result signal from the most significant configurable cell to the common match line based on the upper range comparison and on a second result signal from the next less significant configurable cell.

87. (canceled)